USA Mathematical Talent Search

$$1776^{1492!} \bmod 2003 = \ ? \qquad \textit{Intrigued?}$$

This is the type of problem that appears on the USA Mathematical Talent Search (USAMTS), a **free** mathematics competition open to all United States high school students.

Most competitions require students to answer several questions over a few hours, often in multiple choice format. The USAMTS is different in that students have a full **month** to work out their solutions. Carefully written justifications are required for each problem. The problems range in difficulty from being within the reach of most high school students to challenging the best students in the nation.

Students may use any materials — books, calculators, computers — but all the work must be their own. The USAMTS is run on the honor system — it is an individual competition, whose competitive role is very secondary. (Although we do give prizes.)

Each academic year the USAMTS consists of four rounds, each round featuring five problems. Student solutions to the USAMTS problems are graded by mathematicians and comments are returned to the students. The problems are published on the USAMTS web site on the Internet at

> `http://www.nsa.gov/programs/mepp/usamts.html`

The USAMTS is one of the ways to enter the process for selecting the USA Mathematical Olympiad team, which participates in the International Mathematical Olympiad. With permission, USAMTS participants' names and addresses are provided to colleges, universities, and employers for recruitment purposes. The USAMTS is sponsored by the National Security Agency, the largest employer of mathematicians in the United States and possibly the world.

P.S. The answer is 168.